

# PATENT SPECIFICATION



Convention Date (Germany): June 9, 1922.

313,168

Application Date (in United Kingdom): June 4, 1929. No. 17,131/29.

Complete Accepted: July 24, 1930.

COMPLETE SPECIFICATION.

RESERVE COPY.

## Improvements in or relating to Containers for Bulk Goods.

We, SKIP COMPAGNIE AKTIENGESellschaft, a German Company, and CARL ROEREN, a German citizen, Doctor of Engineering, both of Burohaus "Burg",

Essen, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

With large upright or inclined bulk goods containers as, for example fixed bunkers or movable conveying receptacles such as skips for hoisting plants, objectionable features arise both in the filling as well as the emptying of the containers. These objectionable features are based on the fact that the bulk goods strike against the rigid walls and are thus broken up. At the same time, the walls are greatly worn and dented. When emptying the receptacles, the bulk goods do not slide uniformly but on the opening of the closing trap the whole column of bulk goods moves in jerks. The bulk goods are thus still more broken up and crushed.

The invention obviates all these difficulties by movable members such as ropes, chains, bands, rods, etc., being hung in the containers. These members are, according to the invention, preferably arranged principally in the path of the bulk goods. A particularly satisfactory form of construction is obtained when the members are suspended above the points of entrance.

In order to ensure a uniform discharge of the bulk goods from the container, it may be, according to the invention, preferable to make the separate members of varying lengths. It would appear to be particularly advantageous to increase the lengths of the members towards the centre of the container. The members are, however, only made of such lengths that they do not project beyond the lower part of the container proper, so that they are not forced sideways against the wall by the current of bulk goods flowing out, thus decreasing or nullifying their effect.

In many cases, it may appear advantageous to connect the separate members to each other at different points. This may, for example, be effected by cross

[Price 1/-]

ropes, links or the like. These cross members ensure the maintenance of position in the container.

As on the dropping of the bulk goods strains in the nature of blows may be caused to the members, the suspension of the members according to the invention may be effected by springs.

In order to be able to more or less retard the sliding of the goods in the bunker, the cross section of the members may, according to the invention be increased at certain points. In this case it appears preferable to displace the thickened parts of the members with respect to each other in order that at certain points too great a choking effect shall not take place.

To retard the discharge as also to make it uniform and for the prevention of the formation of lodgments the lower ends of the members may according to the invention be made extra flexible. This may for example be effected by opening out the ends of the ropes brushwise or by fitting pieces of chain, ropes or the like on rods.

The drawing shows several examples in diagram of carrying out the invention. Figures 1 to 3 show rope suspensions in a stationary vertical bunker, in various views. Figure 4 shows the arrangement of the suspended member with an inclined bunker, Figure 5 the use of the invention for a conveyor receptacle, while Figures 6 and 7 represent different possible embodiments of the suspended members.

In the example according to Figures 1 to 3, a number of ropes 3, in two rows, are suspended above the bunker 1 on cross beams 2. The bulk material is, for example, supplied by a conveyor band and flows in the direction of the arrow 5 into the bunker. In this, it rests against the ropes 3 by which it is retained, it then slides down between the ropes. The length of the ropes increases towards the centre of the bunker, as can be seen in particular from Figure 2. The ropes do not, however, extend past the lower end of the bunker.

In the example according to Figure 4, where the corresponding parts are given

the same reference signs, the bulk material is supplied to the inclined bunker 1 by an enclosed rocker 6. In its downward movement, it is braked by the rope 3, so that the separate pieces are not broken up.

In the example according to Figure 5, the ropes 3 are suspended in the conveyor container 11, being fastened at the upper ends to a cross beam 2 above the inlet opening 7.

Figure 6 shows the suspension of the ropes 3 on cross beams 2 with the interposing of springs 8 at the point of suspension, or of springs 9 in the ropes themselves. Furthermore, the figure shows the connection of the ropes themselves by cross ropes 10.

In the example according to the figure, thickened intermediate members 11 are inserted at intervals in the ropes 3, these enlargements being preferably arranged in echelon. The lower ends of the ropes 3 being formed as tufts.

As tests have shown, the well-known difficulties are actually overcome by the simple means according to the invention. In particular the sizes of the individual pieces is only slightly altered even in the case of bunkers with a high drop. The walls of the containers are subjected to little or no strains and consequently last much longer. One of the most important advantages however is the governing of the sliding and discharging processes so that the bulk goods flow in a uniform manner out of the containers.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Apparatus for bulk goods containers characterised by movable members such

as ropes, chains, bands, rods, freely suspended in the containers placed in the path of the inflowing current of bulk goods, and preferably suspended above the point of entrance.

2. Apparatus according to claim 1, characterised by the members being of various lengths.

3. Apparatus according to claim 2, characterised by the length of the members increasing towards the centre of the container.

4. Apparatus according to claim 1, characterised by the members being at the most only of such length that they do not extend beyond the lower part of the container proper.

5. Apparatus according to claim 1, characterised by the separate members being connected together at certain points by cross members.

6. Apparatus according to claim 1, characterised by spring suspension of the members.

7. Apparatus according to claim 1, characterised by the section of the movable members being enlarged at certain points.

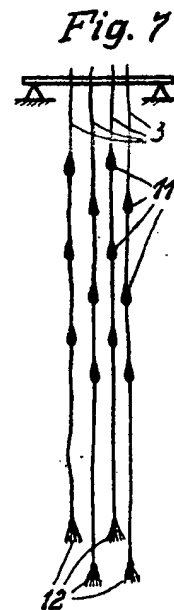
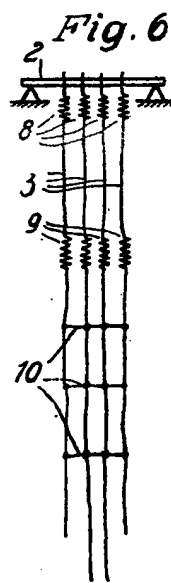
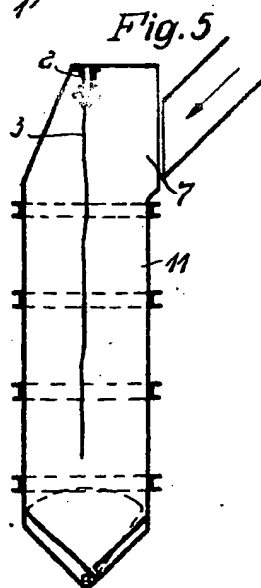
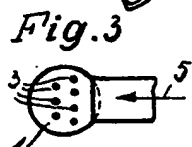
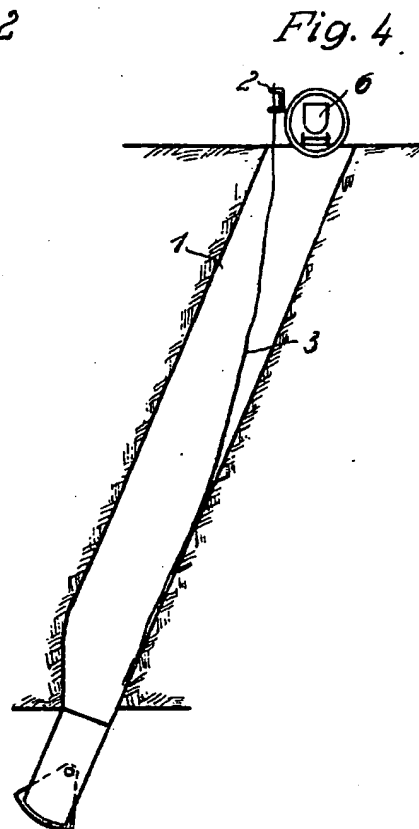
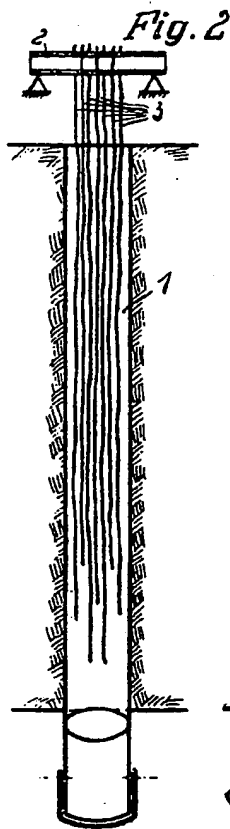
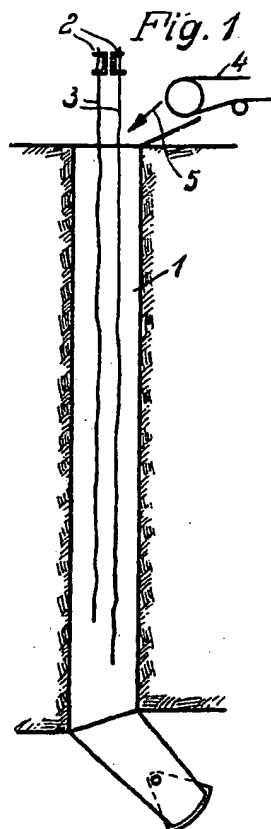
8. Apparatus according to claim 1, characterised by the lower ends of the members being made extra flexible as for example by opening out the ends of the ropes in brush form.

9. Apparatus substantially as herein described with reference to the accompanying drawings.

Dated this 4th day of June, 1929.

HASELTINE, LAKE & Co.,  
28, Southampton Buildings, London,  
England, and  
19-25 West 44th Street, New York,  
U.S.A.,  
Agents for the Applicants.

[This Drawing is a reproduction of the Original on a reduced scale.]



Charles & Read Ltd. Photo Litho.

BEST AVAILABLE COPY